

## ORIGINAL ARTICLE

# A new species of *Drosophila obscura* species group (Diptera: Drosophilidae) from China

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**Abstract** A new species of the *Drosophila obscura* species group is described here, namely *Drosophila glabra* **sp. nov.** It was recently found from the Maoershan National Nature Reserve, Guangxi, China. The characteristics of the new species are based not only on morphological characters but also on DNA sequences of the mitochondrial *COII* (cytochrome *c* oxidase subunit II) gene.

**Key words** Genetic distance, morphology, Old World, Oriental Region, *Sophophora*.

## 1 Introduction

The *Drosophila obscura* species group is one of the major lineages within the well-known sophophoran radiation recognized by Throckmorton (1975). Studies on the taxonomy, geography, chromosomal evolution, reproductive-isolation, protein polymorphism and phylogeny of this group have greatly promoted the early development of evolutionary genetics (Lakovaara & Saura, 1982). A majority of the currently known species of this group (44 in total) was recorded from the Holarctic temperate zone, with the remainder recorded from varied sites in South America (Lakovaara & Saura, 1982; Head & O'Grady, 2000), as well the Afrotropical (Séguy, 1938; Tsacas *et al.*, 1985) and Oriental Regions (Watabe *et al.*, 1996; Watabe & Sperlich, 1997; Gao *et al.*, 2003, 2009; Table 1). In this paper, we describe a new species of the *obscura* group found from our recent field survey in Guangxi, China. The definition of the new species is based on morphological characters and DNA sequences of the mitochondrial *COII* (cytochrome *c* oxidase subunit II) gene.

## 2 Materials and methods

The type specimens of the new species were collected using Toda's "retainer" traps (Toda, 1977) with banana bait in the Maoershan National Nature Reserve, Guangxi, Southern China in 2009. The specimens were then preserved in 70% alcohol and identified in laboratory. Most of the trapped specimens of the *obscura* group were identified as *D. hubeiensis* Sperlich & Watabe, 1997, with only two males recognized as of an unknown species in light of morphology. We then determined the DNA sequences of the mitochondrial *COII* (cytochrome *c* oxidase subunit II) gene for the two specimens using the same method as Gao *et al.* (2007), and calculated the pairwise K2P (Kimura two-parameter) distances between the two newly determined *COII* sequences and 28 previously-collected ones of the *obscura* group (O'Grady, 1999; Gao *et*

**Table 1. Distribution of the *Drosophila obscura* group from the Oriental Region.**

| Species subgroup  | Species   | Distribution   |
|-------------------|---|--|
| <i>obscura</i>    |   |  |
|                   | <i>D. subobscura</i> Collin, 1936               | China (Xinjiang <sup>a</sup> )   |
|                   | <i>D. bifasciata</i> Pomini, 1940               | China (Xinjiang <sup>a</sup> , Heilongjiang <sup>b</sup> , Jilin <sup>b</sup> , Liaoning <sup>c</sup> ); India (Gulmag <sup>d</sup> , Pahalgam <sup>d</sup> )  |
|                   | <i>D. subsilvestris</i> Hardy & Kaneshiro, 1968 | China (Xinjiang <sup>a</sup> )   |
|                   | <i>D. tsukubaensis</i> Takamori & Okada, 1983   | China (Yunnan <sup>e</sup> , Shaanxi <sup>c</sup> , Guizhou <sup>c</sup> )   |
|                   | <i>D. limingi</i> Gao & Watabe, 2003            | China (Yunnan <sup>e</sup> , Guizhou <sup>c</sup> )  |
|                   | <i>D. dianensis</i> Gao & Watabe, 2003          | China (Shaanxi <sup>c</sup> , Yunnan <sup>e</sup> , Jiangxi <sup>c</sup> )   |
|                   | <i>D. epiobscura</i> Parshad & Duggal, 1966     | India (Pahalgam <sup>d</sup> )   |
| <i>sinobscura</i> |   |  |
|                   | <i>D. sinobscura</i> Watabe, 1996               | China (Taiwan <sup>f</sup> )   |
|                   | <i>D. hubeiensis</i> Sperlich & Watabe, 1997    | China (Hubei <sup>g</sup> , Shaanxi <sup>c</sup> , Guizhou <sup>c</sup> , Jiangxi <sup>c</sup> , Fujian <sup>c</sup> , Guangxi <sup>c</sup> , Xizang <sup>c</sup> , Sichuan <sup>e</sup> , Yunnan <sup>e</sup> ) |
|                   | <i>D. luguensis</i> Gao & Toda, 2003            | China (Yunnan <sup>e</sup> , Xizang <sup>c</sup> )   |
| <i>affinis</i>    |   |  |
|                   | <i>D. helvetica</i> Burla, 1948                 | India (Gulmag <sup>d</sup> , Pahalgam <sup>d</sup> )   |
| un-subgrouped     |   |  |
|                   | <i>D. alpina</i> Burla, 1948                    | China (Xinjiang <sup>a</sup> )   |
|                   | <i>D. hypercephala</i> Gao & Toda, 2009         | Malaysia (Sabah <sup>h</sup> )   |
|                   | <i>D. hideakii</i> Gao & Toda, 2009             | Malaysia (Sabah <sup>h</sup> )   |
|                   | <i>D. quadrangula</i> Gao & Toda, 2009          | Malaysia (Sabah <sup>h</sup> )   |

a. Watabe *et al.* (1993); b. Toda (unpublished data); c. Gao (unpublished data); d. Parshad & Duggal (1966); e. Gao *et al.* (2003); f. Watabe *et al.* (1996); g. Watabe & Sperlich (1997); h. Gao *et al.* (2009).

**Table 2. Pairwise K2P distances of the *COII* sequences in the *Drosophila obscura* species group.**

|    | Species                    | GenBank accession number | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    |
|----|----------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1  | <i>glabra</i> (No. 001867) | KP257569                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 2  | <i>glabra</i> (No. 001868) | KP257570                 | 0.015 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 3  | <i>affinis</i>             | M95140                   | 0.083 | 0.087 |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 4  | <i>algonquin</i>           | M95144                   | 0.072 | 0.079 | 0.009 |       |       |       |       |       |       |       |       |       |       |       |       |
| 5  | <i>azteca</i>              | M95146                   | 0.077 | 0.094 | 0.024 | 0.021 |       |       |       |       |       |       |       |       |       |       |       |
| 6  | <i>athabasca</i>           | M95141                   | 0.076 | 0.083 | 0.012 | 0.009 | 0.024 |       |       |       |       |       |       |       |       |       |       |
| 7  | <i>tolteca</i>             | M95152                   | 0.092 | 0.102 | 0.042 | 0.036 | 0.050 | 0.036 |       |       |       |       |       |       |       |       |       |
| 8  | <i>narragansett</i>        | M95149                   | 0.077 | 0.090 | 0.027 | 0.028 | 0.030 | 0.028 | 0.040 |       |       |       |       |       |       |       |       |
| 9  | <i>helvetica</i>           | EF216252                 | 0.084 | 0.100 | 0.059 | 0.052 | 0.062 | 0.052 | 0.065 | 0.062 |       |       |       |       |       |       |       |
| 10 | <i>lowei</i>               | M95142                   | 0.083 | 0.096 | 0.067 | 0.056 | 0.062 | 0.056 | 0.070 | 0.069 | 0.065 |       |       |       |       |       |       |
| 11 | <i>miranda</i>             | M95148                   | 0.090 | 0.092 | 0.063 | 0.056 | 0.061 | 0.061 | 0.085 | 0.072 | 0.076 | 0.062 |       |       |       |       |       |
| 12 | <i>persimilis</i>          | M95143                   | 0.094 | 0.100 | 0.065 | 0.055 | 0.060 | 0.058 | 0.083 | 0.070 | 0.070 | 0.047 | 0.032 |       |       |       |       |
| 13 | <i>pseudoobscura</i>       | M95150                   | 0.094 | 0.100 | 0.065 | 0.055 | 0.060 | 0.058 | 0.083 | 0.070 | 0.070 | 0.047 | 0.032 | 0.000 |       |       |       |
| 14 | <i>limingi</i>             | EF216256                 | 0.094 | 0.110 | 0.100 | 0.088 | 0.101 | 0.098 | 0.108 | 0.100 | 0.100 | 0.109 | 0.103 | 0.100 | 0.100 |       |       |
| 15 | <i>tsukubaensis</i>        | EF216261                 | 0.104 | 0.119 | 0.117 | 0.109 | 0.128 | 0.116 | 0.117 | 0.120 | 0.145 | 0.127 | 0.125 | 0.117 | 0.117 | 0.106 |       |
| 16 | <i>tristis</i>             | EF216262                 | 0.114 | 0.115 | 0.108 | 0.098 | 0.100 | 0.098 | 0.108 | 0.100 | 0.106 | 0.115 | 0.110 | 0.111 | 0.111 | 0.134 | 0.152 |
| 17 | <i>obscura</i>             | AF081356                 | 0.111 | 0.107 | 0.122 | 0.114 | 0.122 | 0.116 | 0.120 | 0.120 | 0.118 | 0.130 | 0.115 | 0.111 | 0.111 | 0.130 | 0.147 |
| 18 | <i>ambigua</i>             | M95145                   | 0.086 | 0.084 | 0.092 | 0.083 | 0.090 | 0.085 | 0.096 | 0.092 | 0.100 | 0.096 | 0.096 | 0.092 | 0.092 | 0.114 | 0.121 |
| 19 | <i>hubeiensis</i> HB       | EF216253                 | 0.067 | 0.076 | 0.081 | 0.070 | 0.077 | 0.070 | 0.081 | 0.078 | 0.086 | 0.074 | 0.084 | 0.081 | 0.081 | 0.108 | 0.094 |
| 20 | <i>hubeiensis</i> YN       | EF216254                 | 0.065 | 0.076 | 0.079 | 0.069 | 0.076 | 0.072 | 0.079 | 0.076 | 0.085 | 0.072 | 0.084 | 0.079 | 0.079 | 0.108 | 0.094 |
| 21 | <i>luguensis</i>           | EF216257                 | 0.069 | 0.080 | 0.083 | 0.072 | 0.079 | 0.076 | 0.083 | 0.079 | 0.088 | 0.074 | 0.094 | 0.077 | 0.077 | 0.110 | 0.094 |
| 22 | <i>sinobscura</i>          | EF216259                 | 0.067 | 0.078 | 0.083 | 0.072 | 0.079 | 0.076 | 0.083 | 0.079 | 0.088 | 0.072 | 0.088 | 0.083 | 0.083 | 0.112 | 0.098 |
| 23 | <i>subsilvestris</i>       | EF216260                 | 0.087 | 0.090 | 0.083 | 0.072 | 0.074 | 0.072 | 0.090 | 0.083 | 0.083 | 0.068 | 0.094 | 0.086 | 0.086 | 0.112 | 0.127 |
| 24 | <i>dianensis</i>           | EF216251                 | 0.079 | 0.092 | 0.083 | 0.072 | 0.070 | 0.072 | 0.083 | 0.079 | 0.074 | 0.070 | 0.086 | 0.085 | 0.085 | 0.102 | 0.123 |
| 25 | <i>bifasciata</i>          | M95147                   | 0.089 | 0.107 | 0.107 | 0.096 | 0.107 | 0.103 | 0.123 | 0.112 | 0.108 | 0.099 | 0.107 | 0.105 | 0.105 | 0.112 | 0.119 |
| 26 | <i>imaii</i>               | EF216255                 | 0.079 | 0.092 | 0.105 | 0.098 | 0.109 | 0.105 | 0.117 | 0.110 | 0.104 | 0.098 | 0.113 | 0.100 | 0.100 | 0.116 | 0.109 |
| 27 | <i>guanche</i>             | AF081354                 | 0.107 | 0.129 | 0.111 | 0.101 | 0.116 | 0.103 | 0.118 | 0.099 | 0.113 | 0.111 | 0.116 | 0.113 | 0.113 | 0.129 | 0.128 |
| 28 | <i>subobscura</i>          | M95151                   | 0.076 | 0.092 | 0.096 | 0.085 | 0.101 | 0.088 | 0.098 | 0.094 | 0.094 | 0.094 | 0.095 | 0.102 | 0.102 | 0.124 | 0.117 |
| 29 | <i>madeirensis</i>         | AF081355                 | 0.094 | 0.101 | 0.097 | 0.093 | 0.110 | 0.092 | 0.111 | 0.099 | 0.103 | 0.099 | 0.095 | 0.105 | 0.105 | 0.118 | 0.111 |
| 30 | <i>microlabis</i>          | EF216258                 | 0.125 | 0.140 | 0.127 | 0.115 | 0.133 | 0.119 | 0.119 | 0.135 | 0.125 | 0.107 | 0.115 | 0.118 | 0.118 | 0.144 | 0.148 |

**Table 2 (continued)**

|    | Species                    | GenBank accession number | 16    | 17    | 18    | 19    | 20    | 21    | 22    | 23    | 24    | 25    | 26    | 27    | 28    | 29    | 30 |
|----|----------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|
| 1  | <i>glabra</i> (No. 001867) | KP257569                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 2  | <i>glabra</i> (No. 001868) | KP257570                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 3  | <i>affinis</i>             | M95140                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 4  | <i>algonquin</i>           | M95144                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 5  | <i>azteca</i>              | M95146                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 6  | <i>athabasca</i>           | M95141                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 7  | <i>tolteca</i>             | M95152                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 8  | <i>narragansett</i>        | M95149                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 9  | <i>helvetica</i>           | EF216252                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 10 | <i>lowei</i>               | M95142                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 11 | <i>miranda</i>             | M95148                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 12 | <i>persimilis</i>          | M95143                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 13 | <i>pseudoobscura</i>       | M95150                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 14 | <i>limingi</i>             | EF216256                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 15 | <i>tsukubaensis</i>        | EF216261                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 16 | <i>tristis</i>             | EF216262                 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 17 | <i>obscura</i>             | AF081356                 | 0.082 |       |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 18 | <i>ambigua</i>             | M95145                   | 0.067 | 0.050 |       |       |       |       |       |       |       |       |       |       |       |       |    |
| 19 | <i>hubeiensis</i> HB       | EF216253                 | 0.095 | 0.103 | 0.076 |       |       |       |       |       |       |       |       |       |       |       |    |
| 20 | <i>hubeiensis</i> YN       | EF216254                 | 0.095 | 0.103 | 0.076 | 0.001 |       |       |       |       |       |       |       |       |       |       |    |
| 21 | <i>luguensis</i>           | EF216257                 | 0.095 | 0.111 | 0.084 | 0.017 | 0.015 |       |       |       |       |       |       |       |       |       |    |
| 22 | <i>sinobscura</i>          | EF216259                 | 0.091 | 0.105 | 0.078 | 0.004 | 0.003 | 0.015 |       |       |       |       |       |       |       |       |    |
| 23 | <i>subsilvestris</i>       | EF216260                 | 0.113 | 0.114 | 0.083 | 0.079 | 0.078 | 0.083 | 0.081 |       |       |       |       |       |       |       |    |
| 24 | <i>dianensis</i>           | EF216251                 | 0.107 | 0.106 | 0.079 | 0.074 | 0.073 | 0.084 | 0.076 | 0.039 |       |       |       |       |       |       |    |
| 25 | <i>bifasciata</i>          | M95147                   | 0.145 | 0.153 | 0.114 | 0.080 | 0.078 | 0.085 | 0.078 | 0.088 | 0.082 |       |       |       |       |       |    |
| 26 | <i>imaii</i>               | EF216255                 | 0.155 | 0.153 | 0.112 | 0.091 | 0.089 | 0.085 | 0.093 | 0.090 | 0.094 | 0.039 |       |       |       |       |    |
| 27 | <i>guanche</i>             | AF081354                 | 0.141 | 0.159 | 0.131 | 0.121 | 0.119 | 0.119 | 0.123 | 0.121 | 0.115 | 0.133 | 0.127 |       |       |       |    |
| 28 | <i>subobscura</i>          | M95151                   | 0.126 | 0.126 | 0.102 | 0.078 | 0.076 | 0.080 | 0.080 | 0.081 | 0.076 | 0.092 | 0.091 | 0.085 |       |       |    |
| 29 | <i>madeirensis</i>         | AF081355                 | 0.146 | 0.142 | 0.109 | 0.098 | 0.098 | 0.102 | 0.102 | 0.086 | 0.081 | 0.098 | 0.100 | 0.090 | 0.040 |       |    |
| 30 | <i>microlabis</i>          | EF216258                 | 0.135 | 0.149 | 0.128 | 0.117 | 0.115 | 0.123 | 0.117 | 0.131 | 0.128 | 0.117 | 0.130 | 0.127 | 0.110 | 0.127 |    |

*al.*, 2007) in MEGA5 (Tamura *et al.*, 2011), in order to conduct a distance-based species delimitation. We use the same method as Fartyal *et al.* (2013) for observing external morphological characters, measuring morphometric characters and dissecting organs. The male terminalia and cibarium of the new species were microphotographed and drawn following Li *et al.* (2014). We follow McAlpine (1981) for morphological terminology, Zhang and Toda (1992) for definitions of measurements and indices. Type specimens are deposited in the Kunming Natural History Museum of Zoology, Kunming Institute of Zoology, Chinese Academy of Sciences (KIZ).

### 3 Results

#### 3.1 Species delimitation with DNA sequences

The pairwise K2P distances in the *obscura* group are shown in Table 2. The two newly determined sequences exhibit a distance of 0.0153. Though this distance is comparable with or even greater than the distances between some closely related species of the same group (e.g., 0.0089 between *D. algonquin* and *D. athabasca*, 0.0150–0.0165 between *D. luguensis* and *D. hubeiensis*), greater intraspecific distances can be found in the same subgenus (e.g., 0.0341 within *D. montana*; Mirol *et al.*, 2007). Taking this into account for the two male specimens, which were collected from the same locality, it is reasonable to consider them as conspecific. They are genetically well diverged from the other species employed here for sequences comparison (K2P distance  $\geq 0.0653$ ), and can be morphologically distinguished from the other members of the *obscura* group. The two male specimens then represent a species new to science.

#### 3.2 Taxonomy

##### *Drosophila glabra* sp. nov. (Figs 1–14)

Description (♂). Head. Slightly wider than thorax (Fig. 2). Eye red, with thick interfacetal setulae (Figs 1–3). Ocellar triangle and orbital plates glossy, blackish brown (Fig. 2). Pedicel grayish brown, with two or three prominent and a few small setae (Fig. 3). First flagellomere grayish brown. Frons black, with several interfrontal setulae (Fig. 3). Arista with 3 (3) dorsal and 2 (2) ventral branches besides terminal bifurcation (Fig. 3). Face and facial carina dark brown, facial carina narrowly hunched but flat along midline, broader below (Fig. 3). Clypeus black (Figs 3, 10). Gena black (Fig. 1). Palpus grayish yellow, with acute apex, somewhat triangular in lateral view, with 1 prominent apical seta and several ventral ones (Fig. 4). Lacinia dorsal arms longer, but ventral arm shorter than half length of the anterior arm (Fig. 5). Prementum medially with a pair of small setae between longer setae (Fig. 6). Cibarium anterior margin thickened, anterolateral corners protruded; anterior sensilla 4, quadrangularly arranged; medial sensilla 13 or 14 per side, trichoid, fairly straight, arranged in two rows which slightly diverged anteriorly, anteriorly shorter, antermost one approximate 1/4 as long as postermost one; posterior sensilla 14–16 per side, trichoid, slightly curved, arranged in two rows which clearly diverged anteriorly, anterior longer, antermost extend much past the sensilla campaniformia, approximate 5 times as long as postermost one and longer than postermost medial sensillum (Figs 7, 10). Labellum with 7 pseudotracheae per side.

Thorax. Scutum and scutellum glossy, black, without any clear longitudinal stripe (Fig. 2); thoracic pleura glossy, blackish brown to black (Fig. 1). Acrostichal setulae in 8 rows (Fig. 2).

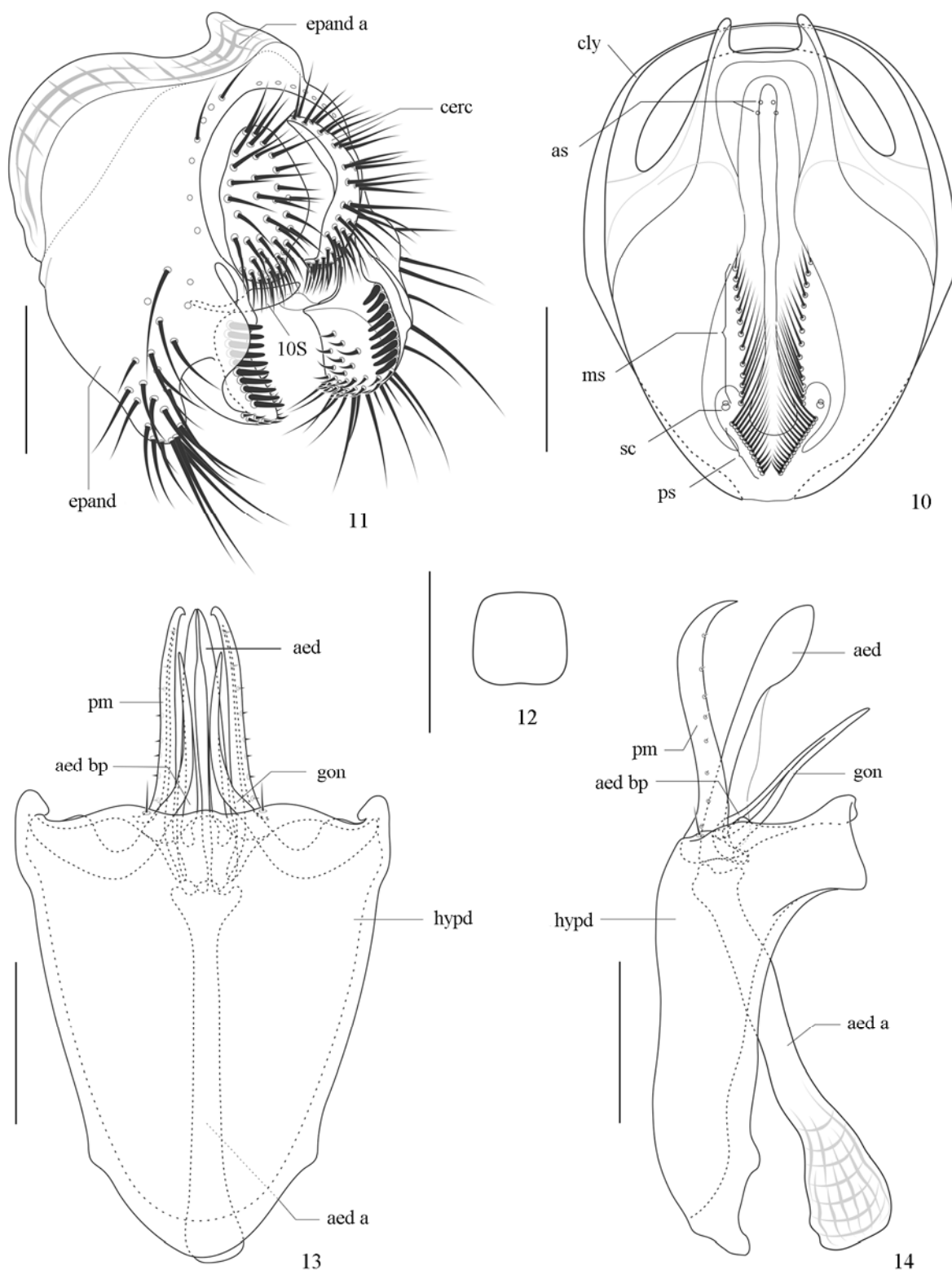
Wing. Hyaline, slightly clouded anteriorly; veins yellowish brown. Halter yellow except for grayish yellow stalk (Fig. 1).

Legs. Coxae and femora blackish brown to black; tibiae blackish brown, darker proximally; tarsi yellowish brown; tibiae and tarsi with recurved setae (Fig. 8). Forelegs. Second tarsomere approximate 3/4 length of first tarsomere; sex-comb teeth 10 or 11 (9 or 10 in paratype) on first tarsomere, 10 (8 or 9) on second tarsomere; both sex-combs arranged slightly oblique against axes of respective tarsomeres (Fig. 9). Preapical setae present on all tibiae; apical seta present on midleg tibia only.

Abdomen. Tergites I and II dark brown, III–(VI+VII) blackish brown to black (Fig. 1); sternites I and II blackish brown, III–V grayish yellow.



Figs 1–9. *Drosophila glabra* **sp. nov.**, holotype, No. 001868. 1. Body, legs and wing, lateral view. 2. Head and thorax, dorsal view. 3. Head, anterior view. 4. Palpus. 5. Lacinia, lateral view. 6. Prementum, ventral view. 7. Cibarium, lateral view. 8. Tibia. 9. Sex-combs on 1st and 2nd foreleg tarsomeres. Scale bars: 1–3=1.0 mm, 4–9=0.1 mm.



Figs 10–14. *Drosophila glabra* sp. nov., holotype, No. 001868. 10. Cibarium. 11. Periphallallic organs. 12. Median piece of 10th sternite. 13. Phallic organs, ventral view. 14. Phallic organs, lateral view. Abbreviations: 10S—10th abdominal sternite, aed—aeagus, aed a—aeagal apodeme, aed bp—aeagal basal process, as—anterior sensilla, cerc—cercus, cly—clypeus, epand—epandrium, epand a—epandrial apodeme, gon—gonopod, hypd—hypandrium, ms—medial sensilla, ps—posterior sensilla, pm—paramere, sc—sensilla campaniformia, sur—surstylus. Scale bars=0.10 mm.

Terminalia (Figs 11–14). Epandrium brown, paler on ventral portion, not pubescent, with 7 (6 in paratype) setae per side along posterior margin of upper half and 32 (31) setae on caudo-ventral portion of lower half (Fig. 11). Surstylus brown, with 9 or 10 (8) peg-like prensisetae, 23 (22) trichoid setae, without hook-shaped projection at dorso-caudal corner (Fig. 11). Cercus dark brown, anteriorly connected to epandrium by membranous tissue, somewhat oval, not pubescent, with 44 (38) setae more densely distributed on lower 1/3 (Fig. 11). Median piece of tenth sternite sclerotized, somewhat trapeziform, nearly as long as wide (Fig. 12); lateral piece membranous, broad, slightly sclerotized laterally. Aedeagus brown, narrow (approximate 1/5 as broad as hypandrium in ventral view), articulated with apodeme (Fig. 13); lateral plates sclerotized, apically expanded and basally with triangular knob in lateral view; median membrane hairless (Fig. 14); apodeme 1.44 (1.56) as long as aedeagus, brown, with muscle-attaching portion more or less flat laterally (Figs 13–14). Paramere as long as aedeagus, with approximately 8 minute sensilla arranged longitudinally on subapical to basal portion, apically curved and pointed, falciform in lateral view (Figs 13–14). Gonopod apically fused to aedeagal basal process (Figs 13–14). Hypandrium with a pair of paramedian setae (Figs 13–14).

Measurements (holotype (paratype), in mm). BL (straight distance from anterior edge of pedicel to tip of abdomen) 2.25 (2.50); ThL (medial distance from anterior notal margin to apex of scutellum) 0.92 (0.93); WL (distance from humeral cross vein to wing apex) 2.10 (2.20); WW (maximum wing width) 1.00 (1.05).

Indices (holotype (paratype), in mm). FW/HW (frontal width / head width) 0.49 (0.48); ch/o (maximum width of gena / maximum diameter of eye) 0.18 (0.25); prorb (proclinate orbital seta / posterior reclinate orbital seta in length) 0.86 (1.02); rcorb (anterior reclinate orbital seta / posterior reclinate orbital seta in length) 0.39 (0.41); orbito (distance between proclinate and posterior reclinate orbital setae / distance between inner vertical and posterior reclinate orbital setae) 0.68 (0.76); vb (subvibrissal seta / vibrissa in length) 0.40 (0.39); dcl (anterior dorsocentral seta / posterior dorsocentral seta in length) 0.54 (0.60); sctl (basal scutellar seta / apical scutellar seta in length) 0.93 (0.85); sterno (anterior katepisternal seta / posterior katepisternal seta in length) 0.31 (0.50); mid katepisternal seta indistinguishable from the other fine setae; dcp (distance between ipsilateral dorsocentral setae / distance between anterior dorsocentral setae) 0.50 (0.54); sctlp (distance between ipsilateral scutellar setae / distance between apical scutellar setae) 1.21 (1.20); C (2nd costal section between subcostal break and  $R_{2+3}$  / 3rd costal section between  $R_{2+3}$  and  $R_{4+5}$ ) 2.84 (3.42); 4c (3rd costal section between  $R_{2+3}$  and  $R_{4+5}$  /  $M_1$  between r-m and dm-cu) 0.99 (0.87); 4v ( $M_1$  between dm-cu and wing margin /  $M_1$  between r-m and dm-cu) 2.00 (2.11); 5x ( $CuA_1$  between dm-cu and wing margin / dm-cu between  $M_1$  and  $CuA_1$ ) 1.77 (1.65); ac (3rd costal section between  $R_{2+3}$  and  $R_{4+5}$  / distance between distal ends of  $R_{4+5}$  and  $M_1$ ) 2.33 (1.95); M ( $CuA_1$  between dm-cu and wing margin /  $M_1$  between r-m and dm-cu) 0.69 (0.68); C3F (length of heavy setation in 3rd costal section / length of 3rd costal section) 0.29 (0.26).

Holotype ♂ (No. 001868), China, Guangxi, Xing'an, Maoershan National Nature Reserve, by banana trap, 19 March 2009, coll. Jian-Jun Gao and Masanori J. Toda (KIZ). Paratype 1♂, (No. 001867), same data as holotype (KIZ).

Distribution. China (Guangxi).

Etymology. The specific name is referring to the hairless median membrane of aedeagus.

Remarks. The new species is distinguishable from other Old World members of the *obscura* group by the combination of the following characters: (1) palpus has a relatively acute apex, giving the entire palpus a somewhat triangular shape in lateral view (Fig. 4); (2) scutum without any clear longitudinal stripe (Fig. 2); (3) foreleg 1st and 2nd tarsomeres with moderately sized sex-combs (with 8–10 teeth), both slightly oblique against the axes of respective tarsomeres (Fig. 9); (4) foreleg 2nd tarsomere approximate 3/4 length of 1st tarsomere (Fig. 9); (5) surstylus without hook-shaped projection at dorso-caudal corner (Fig. 11); (6) median sections of 10th abdominal sternite broad, somewhat trapeziform (Fig. 12); (7) median membrane of aedeagus hairless (not hirsute) (Fig. 14).

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